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# Inequality in children's school readiness and public funding

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> "By the year 2000, all children should enter school ready to learn. . . All children will have access to high-quality and developmentally appropriate preschool programs that help prepare children for school."
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> National Education Goals Panel, Goal 1 (February 1990).[1]

In the decade after the Bush Administration and all 50 state governors made this explicit commitment, funding for early childhood programs expanded dramatically. Federal funding for Head Start, the single largest early education program, increased by over 250 percent; in 2000, it totaled nearly $5.3 billion. State and federal funding for child care subsidies for low-income families rose from $1.7 billion to $9.5 billion. Over $7 billion of this amount was provided by the federal government, more than half of it going toward center-based child care.

In addressing income-based disparities in children's school readiness, the federal government has pursued two parallel policy tracks. On the one hand, it has funded compensatory early education programs explicitly designed to reduce inequality in early education; the largest such program is Head Start. On the other, it has subsidized child care costs for families with low incomes; these subsidies are delivered primarily through two block grants, the Child Care and Development Fund (CCDF) and Temporary Assistance for Needy Families (TANF).[2] States have supplemented these federal funds to differing degrees.

There are still many questions about children's preschool experiences and the rise in public preschool funding. Has the substantial expansion of public funding made inroads into the disparities in preschool enrollment? How good are the various types of programs—are some forms of preschool higher in quality than others? How effective are they in remedying disadvantage—do poor children who attend preschool programs really enter school better prepared to learn? Do any advantages of preschool experience fade over time?

In the research reported here, we examined these and related questions, exploring both the expansion in preschool attendance and its consequences, especially for disadvantaged children, and the effects of the increased outlays on early childhood education and child care over the 1990s.[3] We drew on enrollment data from the Current Population Survey (CPS) and the newly available Early Childhood Longitudinal Study—Kindergarten Class of 1998–99 (ECLS-K). The ECLS-K collected information on school performance, in particular assessing reading ability and math skills for a large, nationally representative sample of children who entered kindergarten in fall 1998. It also assembled a rich array of family, school, preschool, and local and regional information.

In our research, we considered several different kinds of formal preschool.[4] *Prekindergarten programs* provide a year or two of education, funded by public school systems, before children enter kindergarten. In 2000, 39 states had prekindergarten initiatives, although state prekindergarten spending was extremely variable. In 2002, approximately $2.9 billion in state funding was available, and about 14 percent of 4-year-olds nationwide were enrolled in such programs, which usually consist of part-day programs located within public schools. With the exception of a few states that have universal prekindergarten programs, all such early programs are specifically targeted to children "at risk" of educational difficulty because of poverty, limited English proficiency, or a disability.[5]

*Head Start* programs serve primarily 3- and 4-year-olds from economically disadvantaged families; the programs are required to maintain a comprehensive focus including health and nutrition programming, social services, and parent involvement. Head Start funding is disbursed directly to about 1,500 private and public not-for-profit organizations, which served nearly 860,000 children in 2000—about 12 percent of children nationwide and only slightly more than half of those eligible.[6] The vast majority of programs used to operate part time and part year but

as more poor mothers enter the workforce many programs are expanding to provide full-day services.

The primary purpose of traditional *preschools* and *nursery schools* is to provide early educational experiences to 3- and 4-year-olds. These programs are often part-day or part-week, though, like Head Start, many now serve children of working parents for longer hours and provide wraparound child care. They thus overlap with *center-based child care programs,* which are typically available 9–10 hours a day, 5 days a week, and may serve children of all ages. These types of programs are usually privately funded for-profit or not-for-profit programs that charge a fee. The CCDF and TANF block grants can be used to subsidize care in center-based child care programs for low-income children, through direct contracts with private providers or, more commonly, reimbursements for services provided to individual children. An estimated 15 to 20 percent of families who are income-eligible under federal rules receive subsidies in most states and the share of these families who use center-based care varies widely by state.

## Public funding of preschool programs and the enrollment of disadvantaged children

Over the last three decades the changes in preschool attendance have been, if anything, even more dramatic than the changes in public funding. In 2001, for example, 39 percent of 3-year-olds and 66 percent of 4-year-olds were enrolled in a center-care or preschool program, up from 8 and 23 percent, respectively, in 1970.[7] Nonetheless, there remained large and persisting gaps between the enrollment of advantaged and disadvantaged children in preschool; poor children were much less likely to attend. In 1993 the National Household Educational Survey found a difference of 11 percentage points between poor and nonpoor children's preschool attendance.

Race, ethnicity, income, and parental education are all closely linked to the likelihood that a child will be enrolled in preschool. One major source of the persisting disparities in preprimary enrollment is without question the cost of such services. With the cost of full-time private preschool or center-based care averaging between $4,000 and $6,000 a year in the late 1990s, early education or formal child care arrangements are prohibitively expensive for many low-income families; such costs could represent as much as a quarter of total household income. And the choice of preschool care is not merely a matter of preference. Evidence suggests that, all else equal, many families would prefer to use more formal care arrangements. If family income rises, or the cost of care drops, families tend to substitute more formal types of center and family child care for informal arrangements.[8] One study has found that the use of center-based care by low-income single mothers rises by about a third when care is subsidized.[9]

Given continuing disparities in attendance, has increased public funding made a difference? The expansion of compensatory education programs such as Head Start is likely to have the most direct effect on enrollment disparities by expanding the supply of low-cost or free preschool slots. Program enhancements within Head Start, including the expansion from part- to full-day services in many programs, may, however, have diluted the effect of funding increases on participation rates. The effects of block grant subsidies are less clear. States are required to support parental choice of care arrangements, which would be expected to increase parents' demand for and use of preschool-like arrangements. This increase may be diluted, however, by state policies that inhibit or discourage the use of subsidies for these programs. Low reimbursement rates may create disincentives for private preschool programs to accept subsidies; high copayments may steer parents away from more expensive preschool programs; and requirements for establishing and maintaining eligibility may make the use of preschool programs difficult for subsidy recipients.

In trying to estimate the effects of increased funding on preschool enrollments, we must bear in mind two other factors. First, are the new low- or no-cost alternatives supplementing or substituting for existing arrangements? If low-income parents were entirely priced out of preschool or center-based care, the new subsidies may enable them to shift from informal child care to more formal types of care. But if the availability of funding merely enables parents to shift children out of existing preschools or centers into subsidized alternatives, there is no net gain in preschool enrollment. Second is the question of secular trends in enrollment among all groups. If early education enrollment is rising even faster among higher-income groups than among children from low-income families, income-related disparities in enrollment may not change noticeably.

Our analysis made use of microdata for a sample of nearly 24,000 children from the October Current Population Survey (CPS) for 1992 to 2000. The survey annually includes an education module that tracks school attendance among 3- and 4-year-olds. The CPS also includes extensive information on characteristics of children and families that may affect preschool attendance. We supplemented CPS data with state-level information on Head Start and child care expenditures and on demographic, political, and policy measures. Because large changes in welfare policies in the 1990s were designed to promote employment among low-income parents, we included measures of the central features of these changes. The results for a single sample—albeit a large one—cannot necessarily be generalized to all U.S. preschoolers. Nevertheless, the sample is drawn primarily from the large states in which most children live.

For this sample of children, total federal funding for early education and child care nearly tripled during the 1990s

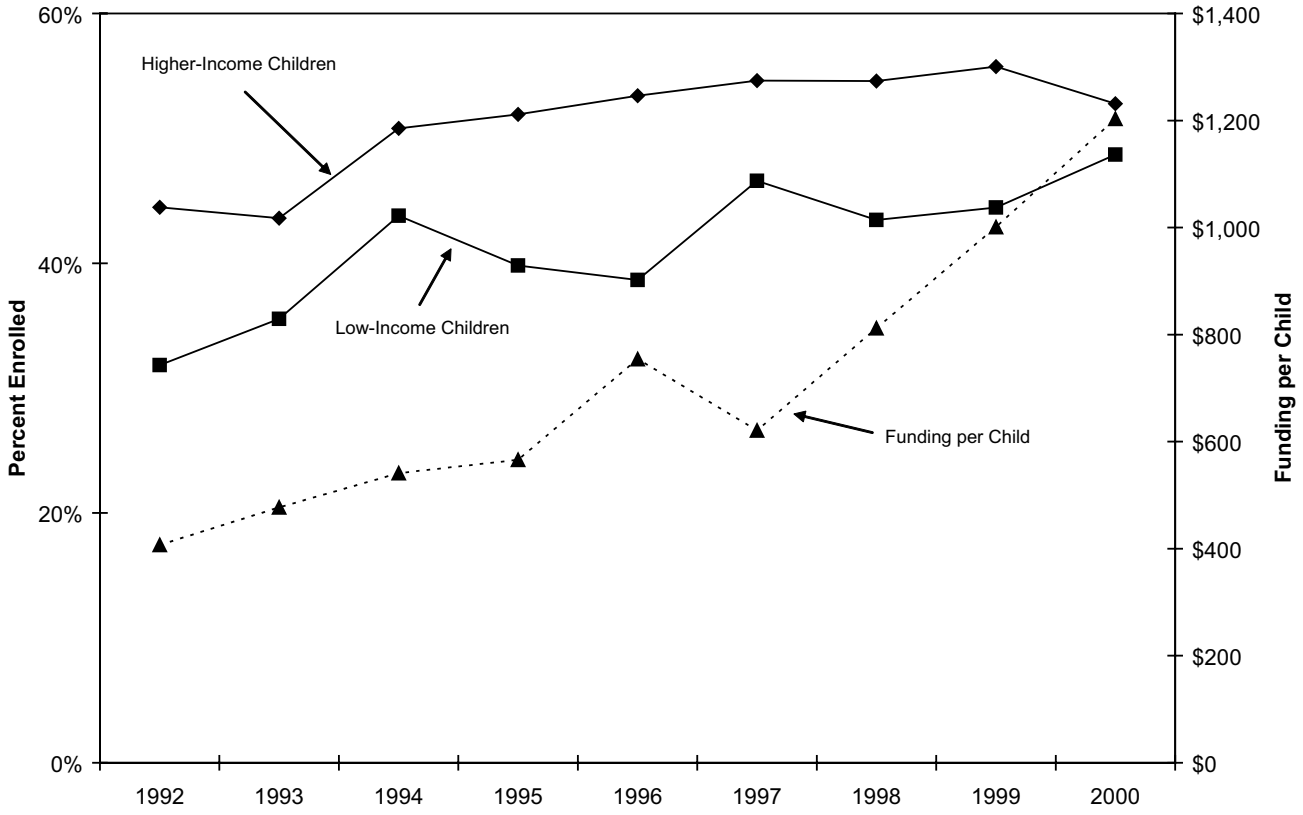


**Figure 1. Average early-education enrollment of 3- and 4-year-old children, 1991–2000.** Low-income children are defined as those in the bottom 25 percent of family incomes; higher-income children are those with families in the upper 75 percent of incomes. Funding is calculated as amount per poor child under age 13.

**Source**: October CPS data, 1991–2000.

(Figure 1). Before 1996, funding for both compensatory education and child care subsidies increased at a roughly similar rate; thereafter, funding for child care outstripped that for compensatory education. In 1992, subsidy funding accounted for about half of total funding; in 2000, it was over two-thirds of the total ($815 per poor child under age 13 for subsidies versus $388 for compensatory education).

Although low-income children in 2000 were still less likely than their higher-income peers to attend early education, the increases in their enrollment over the decade were larger, showing gains of about 16 percentage points, compared with 8 percentage points for higher-income children (Figure 1). But to what extent did public funding play a role in that increase? To answer this question we turned to a series of multivariate regressions for both the full sample of children and for subgroups defined by income and a variety of demographic characteristics.

Our first set of estimates, for the entire sample of children, suggested that there was little relationship between public funding for early education and care and overall increases in enrollment. Several characteristics of the child and family mattered, such as mothers' educational attainment and employment status, as has been consistently the case in prior research.

The picture changed when we conducted separate analyses for low- and higher-income children. Public early education and care funding demonstrated a significant role in the enrollment of low-income children. We estimated that an additional $100 of public expenditure per poor child under age 13 increased the early education enrollment rate among poor children by 1 percentage point from an average base rate of 41 percent. Given an increase in funding of about $800 over this decade, our model estimates suggest that public funding accounted for between 8 and 11 percentage points of the 16-percentage-point enrollment gain. In contrast, public funding had no effect on the enrollment of higher-income children.

Did the effects of Head Start funding differ from those of child care subsidies? We considered both types of funding separately for low-income children. Child care subsidies, which included welfare and CCDF money, mirrored our results for total child care funding—hardly surprising, since these subsidies formed the bulk of all funding for early education programs over the decade. Head Start eligibility is restricted to children with family income

below the poverty line, so we limited our sample to children in the bottom 13 percent of the income distribution—approximately the equivalent of families below the poverty line. We found that the Head Start funding was significantly associated with increases in early education enrollment.

The effects of funding also differed over time. Effects on preschool enrollment were greater between 1992 and 1996 than they were thereafter; examining only the period 1992 to 1997, we found that an additional $100 in funding would have resulted in more than a 3-percentage-point increase in enrollment. This difference remained whether we considered all funding or subsidies only, so the answer cannot lie in the faster growth of subsidies relative to compensatory education from 1997 on. Perhaps an explanation is to be found in changes in child care markets or state administrative practices in the late 1990s. Increased emphasis on the rapid employment of welfare recipients may have increased families' need for—and welfare agencies' encouragement of—informal child care arrangements that were more readily available and less expensive for parents leaving welfare.

Is an increase of 8 to 11 percentage points a large effect, considering that available public funding during this time increased by over 300 percent for poor children under the age of 13? The answer is not straightforward. First, parents take into account many other issues besides price when making child care decisions—convenience, accessibility, and safety, consonance with work schedules and values. Increasing rates of employment during this time, especially among low-income mothers, may have made preschool more attractive to some parents, less attractive to others, depending on their circumstances. Second, over half the funding and much of the growth in funding during this period came in the form of unconstrained child care subsidies, rather than money specifically designated for early education. Finally, the overall amount of spending per poor child was still well below the cost of full-time center-based care or preschool. Indeed, with an average allocation of $1,200 per poor child even after funding increases in the 1990s, only a fraction of poor children would have had access to such care.

It seems clear from our findings that the disparities in preschool enrollment between low- and higher-income children would have been larger if public funding had not increased during the 1990s. Further expansions are likely to shrink the disparities even more. But the structure of funding matters. Unconstrained subsidies allow parents the greatest degree of choice in selecting child care arrangements. But are they a weaker tool for reducing disparities than investments directed specifically toward expanding the supply of free or affordable early education services?

The answer depends in part on the quality of the programs children attend and the benefits children gain from their preschool experiences.

## The quality of preschool experiences

How good are the various types of preschool? One way to judge the quality of an early childhood program is by measuring the structural components associated with higher-quality caregiving—child-staff ratios, class sizes, and caregiver education. By these criteria, most state prekindergarten programs appear to provide relatively high-quality care. For example, 86 percent of school-based prekindergarten teachers had a four-year college degree, more than twice the rate of college degrees among center-based child care workers. Head Start programs are required to undergo a federal quality review at least once every three years; 85 percent of reviewed centers met the standards of adequate care in 2000, but low pay and low levels of provider education may constrain the quality of the programs.

Preschools and child care centers are not regulated by the federal government, and state regulations vary greatly in their stringency and enforcement. Moreover, child care subsidies may be used to offset a variety of child care and early education arrangements because their primary goal is to support the employment of low-income parents. If state program operators want to stretch available dollars to cover as many recipients as possible, they may encourage families to use less expensive types of care or may set reimbursement rates lower than preschool fees. It is thus not clear that increases in child care subsidies will translate into increases in preschool enrollment or will improve the quality of center-based care. Indeed, an examination of the structural features of center-based care suggested that their quality was, on average, mediocre. A direct assessment of child care centers by the Cost, Quality, and Child Outcomes Study in 1993 found that only 24 percent provided good or developmentally appropriate care, while rating 10 percent as poor.[10]

## Does preschool improve school preparation and performance?

Experimental programs, most of them small in scale and very intensive, have confirmed the importance of early childhood education in raising children's school readiness, though there has been much debate over the persistence of early effects.[11] Yet a decade after the government established its educational goals, the enrollment of children from disadvantaged families in early education programs and center-based care is still far lower than that of

**Table 1**
**Some Characteristics of Children in the ECLS-K Study, by Primary Child Care Arrangement in Year Before Kindergarten**

| Child's Characteristics | All Children (N = 12,804) | Parental Care (N = 2,124) | Other Nonparental Care (N = 1,525) | Head Start (N = 1,395) | Center-Based Care (N = 7,760) |
|---|---|---|---|---|---|
| Black (%) | 15 | 11 | 13 | 41 | 12 |
| Hispanic (%) | 12 | 16 | 15 | 15 | 10 |
| Asian (%) | 4 | 5 | 5 | 23 | 4 |
| Family Income-to-Needs Ratio[a] | 3.28 | 2.41 | 2.87 | 1.26 | 3.93 |
| Single-Parent Household (%) | 19 | 14 | 25 | 37 | 17 |

**Source**: K. Magnuson, M. Meyers, C. Ruhm, and J. Waldfogel, "Inequality in Preschool Education and School Readiness," *American Educational Research Journal* 41, no. 1 (2004): 115–57.

[a]A family living below the poverty line is defined as having an income-to-needs ratio of less than one.

children from more affluent families. As Figure 1 shows, income matters; children in families with incomes below the poverty line have consistently been far less likely to be in any kind of center-based care than more affluent children. Parents' education matters also; children whose mothers did not complete high school, for example, were half as likely to be in center-based care as those whose mothers had a college degree.

Children from low-income families are precisely those for whom preschool might offer an important academic advantage. Early in life, responsive and cognitively stimulating care fosters the language and cognitive skills that make learning come more easily. Economically struggling families may be limited in the types and quality of learning experiences they can provide their children, and these children lag in acquiring the skills necessary for school achievement. As one consequence, close to 40 percent of the association between poverty and young children's lower academic performance is explained by the lower quality of home learning environments, particularly for language. One study estimated that by the age of 3, children in families receiving welfare had vocabularies only half as large as those of more affluent children.[12] Absent any preparation, therefore, children from poor families enter school with fewer academic skills than more advantaged peers (although no less enthusiasm for learning), and the substantial gaps in academic competency and achievement persist into higher grades.

We examined the effects of preschool programs in a set of papers drawing on about 13,000 children who entered kindergarten in the fall of 1998, when they were on average 5 years and 7 months old (Table 1). Among these children, about 61 percent had attended preschool (including17 percent of the sample who attended prekindergarten), and 11 percent Head Start; 12 percent had some other type of nonparental care, and 17 percent had parental care only (not shown in table). Our analyses took into account many demographic, personal, and family characteristics, such as the child's health status at birth, parental education, family structure and size, ethnicity, and language spoken at home. We incorporated a diverse set of measures of home and family resources and parenting practices—books and computers in the home, parents' interactions with and expectations for the children. Our information about early child care and about the home environment came from parent surveys. In our analyses we distinguished between preschool (including prekindergarten and center-based child care) and Head Start, and focused primarily on the effects of typical preschools.[13] We also included measures of the academic environment in the school and neighborhood quality. Regression analysis was used to estimate the effects of preschool both for the entire group and for different subgroups defined by income, parental education, and the kind of preschool attended.

Our measures of children's math and reading skills were derived from the ECLS-K assessments carried out during the fall of kindergarten and the spring of first grade. Our most complete model, which takes into account the many family and neighborhood conditions noted above, showed that, over all, preschool attendance increased children' academic school readiness. Children who attended preschool performed significantly better in both math and reading in the fall of their kindergarten year, compared to children cared for only by their parents before kindergarten. The magnitude of the effects is such that attending preschool rather than parental care would move the average child at the 50$^{th}$ percentile to the 54$^{th}$ percentile on reading, and the effects on math skills were of a similar size.

Preschools and many center-based programs provide a curriculum designed to enhance school readiness. The differences in quality noted earlier suggest that the benefits of these other forms of preschool may be smaller than those of prekindergarten. In our analyses, prekindergarten yielded consistently larger benefits than other forms of preschool, though children who attended any kind of preschool performed significantly better than children who were in parental care only.

**Table 2**
**Preschool Enrollment and Children's School Performance over the First Two Years of School (OLS Estimates)**

| | Full Sample (N= 10,224) | | Children of Parents with Low Education or in Poverty (N=2,328) | | Children of Welfare Recipients (N=1,033) | |
|---|---|---|---|---|---|---|
| Year Before | Reading | Externalizing Behavior | Reading | Externalizing Behavior | Reading | Externalizing Behavior |
| | | | Fall of Kindergarten | | | |
| Prekindergarten | 1.82** | 1.88** | 2.37** | 2.40** | 2.80** | 1.69 |
| Preschool | 1.16** | 1.38** | 1.47** | 1.90** | 1.51* | 0.46 |
| | | | Spring of First Grade | | | |
| Prekindergarten | 0.27 | 2.13** | 0.62 | 2.76** | 1.88 | 4.15** |
| Preschool | 0.18 | 1.42** | 0.34 | 1.96** | 0.31 | 0.59 |

**Source**: K. Magnuson, C. Ruhm, and J. Waldfogel, "Does Prekindergarten Improve School Preparation and Performance?" NBER Working Paper 10452, April 2004 (revised September 2005). Coefficients estimated the effects of attending prekindergarten and preschool in the year prior to kindergarten compared with only receiving parental care.

p-value: *<.05; **<.01

There is some evidence that early academic advantages associated with preschool fade over the first two years or so of elementary school. To address this issue, we assessed children's academic performance and behavior in the spring of first grade (that is, in 2000 for children who entered kindergarten in fall 1998). Compared to the results at school entry, the positive effects of preschool on academic performance were much reduced by the spring of first grade; we estimate that 60–80 percent of the cognitive gains associated with attending preschool and prekindergarten had dissipated by that point.

### Preschool programs and disadvantaged children

Previous research has found that early education programs have larger effects for children from economically disadvantaged families, perhaps because the children come from homes with more meager learning environments and less cognitive and language stimulation. In another study, using a smaller sample of children, we examined more closely whether the effects of preschool and prekindergarten that we found might differ according to children's levels of social and economic disadvantage, which we defined in several ways, and whether these benefits might persist over time. For example, we identified children with family incomes below the federal poverty threshold and a parent with less than a high school education and children whose families received welfare cash benefits. Some results of this analysis for the entire sample and for low-income families appear in Table 2.

As expected, the effects of preschool and prekindergarten were larger for disadvantaged children, compared with their peers. Furthermore, for these disadvantaged children prekindergarten consistently conferred larger benefits than other types of preschool. For example, the average child in poverty or with an uneducated parent who did not attend preschool was reading at the 33rd percentile in kindergarten; prekindergarten attendance raised predicted performance to the 44th percentile. The effects of prekindergarten also appeared to be more persistent for disadvantaged children. For example, reading effects remained large and math effects (not shown in Table 2) remained significant for children from welfare families in the spring of first grade.

### Preschool attendance and children's behavioral problems

Although preschool attendance improved academic skills, it appears to have had some contrary effects on behavior. Using teacher reports of children's classroom behavior, we found that children attending preschool and prekindergarten had higher levels of teacher-rated externalizing behavior (e.g., moving prekindergarten children from the 50th to the 55th percentile) and lower levels of self-control (e.g., moving prekindergarten children from the 50th to the 46th percentile). Prekindergarten was linked to slightly more adverse effects on behavior than other types of preschool. This is somewhat puzzling—in general, higher-quality care is associated with lower levels of problem behavior—but perhaps some aspects of some prekindergartens, such as teacher-directed basic skill instruction, may create less positive social climates and more behavior problems among very young children.

In contrast to academic performance, the correlation with problem behaviors persisted into first grade. For disadvantaged children, the negative behavioral effects of prekindergarten attendance were no larger than those of other groups in the months after school entry, but the behavioral consequences were larger when measured in first grade.

If preschool and prekindergarten raise academic achievement only temporarily for most children, while having

The persisting larger academic benefits for disadvantaged children suggest that the greatest return to public investments in early education may be obtained by increasing the enrollment of such children in preschool and prekindergarten. In order fully to assess the importance of the enrollment changes we have documented, however, we would want to know more about the quality of the programs children are attending relative to the child care they would otherwise have experienced. Especially important is the question whether the greater school readiness of children who have attended preschools is translated into a continuing higher level of academic achievement as the children move through the elementary and secondary grades. And if effects do fade, to what extent might this be due to the characteristics of the elementary schools that these children attend? These last questions remain important avenues for future research.■

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[1]Accessed 8/23/2005 at http://govinfo.library.unt.edu/negp/page3-3.htm.

[2]TANF funds intended to assist families transitioning off welfare can be transferred to CCDF programs.

[3]The research summarized here is reported in three articles: K. Magnuson, M. Meyers, C. Ruhm, and J. Waldfogel, "Inequality in Preschool Education and School Readiness," *American Educational Research Journal* 41, no. 1 (2004): 115–57; K. Magnuson, C. Ruhm, and J. Waldfogel, "Does Prekindergarten Improve School Preparation and Performance?" NBER Working Paper 10452, April 2004, National Bureau of Economic Research, Cambridge, MA (revised September 2005); and K. Magnuson, M. Meyers, and J. Waldfogel, "The Effects of Expanded Public Funding for Early Education and Child Care on Preschool Enrollment in the 1990s," unpublished paper, University of Wisconsin–Madison, 2005.

[4]There exist many kinds of informal child care, from family members, babysitters, and the like, and these are still common, especially among poor families. About 45 percent of 4-year-olds are in some form of informal care for 10 or more hours a week. NICHD Early Child Care Research Network, "Early Child Care and Children's Development prior to School Entry: Results from NICHD Study of Early Child Care," *American Educational Research Journal* 39 (2002): 133–64.

[5]For information and links to current research regarding the various types of early education initiatives, including preschool and prekindergarten, see the Web site of the National Institute for Early Education Research <http://nieer.org/>.

[6]Administration for Children and Families, Head Start Fact Sheet 2001. Last accessed August 26, 2005 from http://www.acf.hhs.gov/programs/hsb/research/factsheets.htm

[7]J. Bainbridge, M. Meyers, S. Tanako, and J. Waldfogel, "Who Gets an Early Education? Family Income and the Gaps in Enrollment of 3-to-5-year-olds from 1968–2000," *Social Science Quarterly* 86 no.3 (September 2005): 724–58.

[8]D. Blau, *The Child Care Problem: An Economic Analysis* (New York: Russell Sage Foundation, 2001).

[9]Erdal Tekin, "Child Care Subsidy Receipt, Employment, and Child Care Choices of Single Mothers," NBER Working Paper 10459, National Bureau of Economic Research, Cambridge, MA 2004.

[10]S. Helburn, ed., *Cost, Quality, and Child Outcomes in Child Care Centers: Technical Report.* Department of Economics, Center for Research in Economic and Social Policy, University of Colorado at Denver, 1995; NICHD Early Child Care Research Network, "Child Care Structure → Process → Outcome: Direct and Indirect Effects of Child Care Quality on Young Children's Development," *Psychological Sciences* 13 (2002): 199–206, and NICHD, "Early Child Care and Children's Development."

[11]See, for example, a special issue of *Focus* 19:1, Summer/Fall 1997, "Investing in Young Children."

[12]B. Hart and T. Risley, *Meaningful Differences in the Everyday Experiences of Young American Children* (Baltimore: Brookes, 1995).

[13]Head Start effects are analyzed in first-year findings from a major study released by the Administration for Children and Families (ACF) in June 2005: *Head Start Impact Study: First Year Findings*. Information about the study and the full text of the report are available on the ACF World Wide Web site at http://www.acf.hhs.gov/programs/opre/hs/impact_study/.